

Dieter's Nixie Tube Data Archive

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Thank you!

Document in this file	Burroughs – Bulletin 1104C – Dated May 15, 1968
Display devices in this document	B-5440, B-5441, B-5442, SK-182, SK-183, SK-184, SK-185, SK-193, SK-194, SK-195, SK-196, SK-197, SK-198, SK-199, SK-200

B NIXIE® NUMERICAL INDICATOR TUBE

TYPE
B-5440
B-5441
B-5442

The B-5440 NIXIE tube is a gas filled, cold cathode, ultra long life, decimal input, side viewing numerical (0-9) indicator tube having a common anode. The B-5441 is identical to the B-5440 except it has two decimal points (right and left of the numeral) inside the tube, which are independently operable (Note 2). The B-5442 is available for plus-minus indication. The narrow width of the tubes (.750" max.) permit 0.80" center-to-center spacing for multi-tube assemblies and its short seated height (1.8") allows minimal instrument panel height. Printed circuit and wiring type sockets are also available. (See Pages 3 and 4.)



ACTUAL SIZE

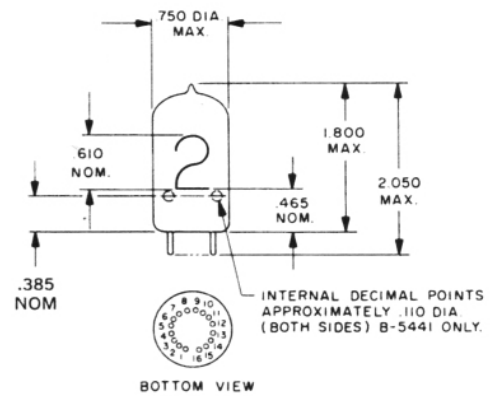


Figure 1. Outline Drawing
 (Note 3)

ELECTRICAL SPECIFICATIONS

ABSOLUTE RATINGS

Ionization Voltage	+170 Vdc max. (Note 6)
Supply Voltage	+170 Vdc min. (Note 1)
Cathode Current	3.5 ma max.
Decimal Point Current (B-5441)	0.7 ma max.
Cathode Pre-bias Voltage	+60V to +120V (Note 7)

TYPICAL OPERATING CONDITIONS (Figure 2)

Supply Voltage	+170 Vdc (Note 1)
Series Resistor	10K ohm (Notes 1 & 8)
Numeral Cathode Current	
(B-5440)	2.5 ma (1.5 to 3.0 ma)
(B-5441)	2.5 ma (1.5 to 3.0 ma)
Decimal Point Cathode Current	
(B-5441)	0.5 ma nom. (Note 2)
Cathode Pre-bias Voltage	+60V (Notes 2b & 7)

MECHANICAL CHARACTERISTICS

Outline Drawing	Figure 1	Printed Circuit Pattern Layout	Figure 4
Pin Connections	Table 3	Color	Neon Red
Mounting	Note 3	Life (Dynamic)	200,000 hrs.
Sockets (Table 4)	Figures 5, 7, 8, 9 & 10 Note 5	Brightness	200 footlamberts
Recommended Printed Circuit Board Layout	Figure 3, Notes 4 & 5		

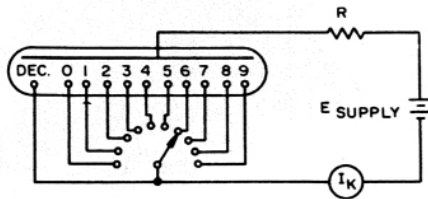


Figure 2. TEST CIRCUIT
(See Notes 1, 2a & 2b)

PIN	CONNECTION	PIN	CONNECTION
1	ANODE	9	K3
2	K1	10	K4
3	K2 (-)**	11	RIGHT DEC. PT.*
4	K9	12	K5
5	K7	13	K6 (+)**
6	LEFT DEC. PT.*	14	K0
7	K8	15	INT. CONN.
8	INT. CONN.	16	INT. CONN.

* With B-5441 only, otherwise int. conn.

** The B-5442 Only — Anode is Pin 1.

Table 1. TERMINAL CONNECTIONS B-5440, B-5441

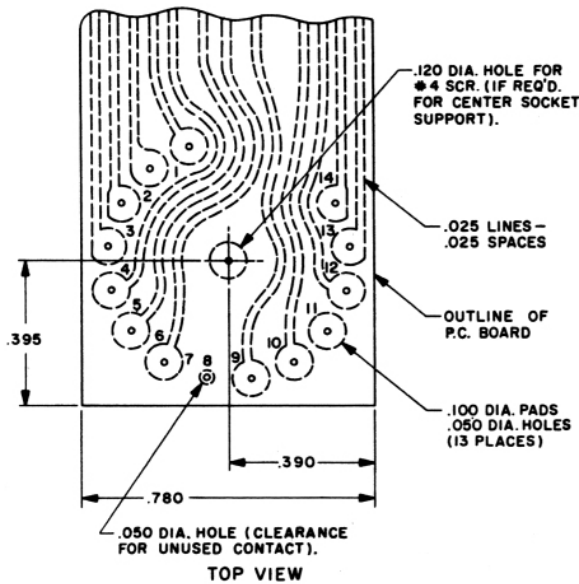


Figure 3. RECOMMENDED PRINTED CIRCUIT BOARD LAYOUT
(See Notes 4 & 5)

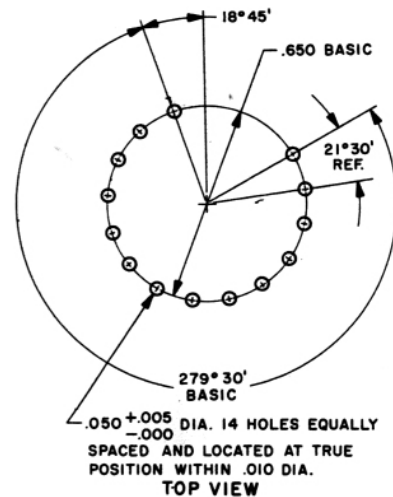


Figure 4. P/C BOARD PATTERN LAYOUT
(See Note 5)

SUPPLY VOLTAGE (Vdc)	170	200	250	300
Anode Resistor B-5440 (KΩ)	10	22	43	62
Anode Resistor B-5441 (KΩ)	10	20	39	56

Table 2. ANODE RESISTORS
(See Notes 1 & 2a)

SUPPLY VOLTAGE (Vdc)	170	200
Decimal Point Resistor (KΩ)	47	100

Table 3. DECIMAL POINT CATHODE RESISTOR
(See Note 2b)

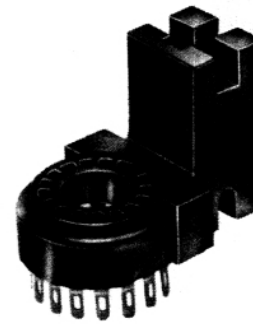
NOTES

- The minimum supply voltage should be 170 Vdc, however, the use of the highest voltage available with an appropriate series resistor is recommended.
- The decimal points in the B-5441 should be used as follows:
 - When a numeral is always "on"—use an anode resistor as specified in Table 2.
 - When a numeral and a decimal point will not be lighted at the same time (numeral and decimal point is lighted alone)—use an anode resistor specified in Table 2 and insert a resistor in series with the decimal point cathode, as specified in Table 3. Note: in this mode of operation, the Supply Voltage cannot exceed 200V and the Pre-bias voltage is 100V minimum.
- For proper viewing, the tube should be oriented so that the keyway is directly opposite and away from the viewer.
- The recommended printed circuit board layout for the B-5441 socket is shown with a run to terminal 6 (left decimal point) and no run to terminal 11 (right decimal point). If terminal 11 is to be used instead of terminal 6, omit the run to terminal 6, reposition runs 7, 9 and 10, and add a run to terminal 11. For the Type B-5440, the run can be omitted. See Figure 3
- In order to use the printed circuit layout shown, contacts 15 and 16 of the SK-182 — SK-185 sockets must be removed.
- Ionization Voltage: Voltage necessary for breakdown between anode and cathode.
- Pre-bias Voltage is the potential difference between "on" and "off" cathodes. It should be sufficiently high to avoid objectional background glow and yet not so high as to cause the "off" cathodes to function as anodes.
- The anode series limiting resistor can be calculated on the basis of an anode current of 2.5 ma for the B-5440 and 2.8 ma for the B-5441 and a tube voltage drop of 145V (B-5440)/142V (B-5441). (Sustaining Voltage)
- Contacts are not inserted into positions 15 and 16.
- All tolerances to be $\pm .005$ unless otherwise specified.

There are three basic types of sockets for the B-5440 series NIXIE tubes, SK-182 — SK-185 for chassis mounting, SK-194* and SK-196* for "mother board" mounting, SK-197 — SK-200* for right angle mounting.

Each is available in diallylphthalate casting with gold plated contacts or G. P. phenolic casting with cadmium plated contacts, for wiring of PC applications (See Table 4). As shown in the figures below, these sockets can be used in a variety of ways, depending on the particular application.

*(Note: SK-194 — SK-200 will be available in August 1966)



SK-197 — SK-200

SOCKET	DIALYL. WITH GOLD PLATED CONTACTS	G.P. PHENOLIC WITH CADMIUM PLATED CONTACTS	WIRING TYPE	P.C. TYPE	MODULE MOUNTING TYPE	FIGURE NO.
SK-182	X		X			7 & 10
SK-183	X			X		7 & 10
SK-184		X	X			7 & 10
SK-185		X		X		7 & 10
SK-193	X		X			5 & 8
SK-194	X			X		5 & 8
SK-195		X	X			5 & 8
SK-196		X		X		5 & 8
SK-197	X		X		X	6 & 9
SK-198	X			X	X	6 & 9
SK-199		X	X		X	6 & 9
SK-200		X		X	X	6 & 9

Table 4. SK-182 — SK-200 SOCKET CHARACTERISTICS

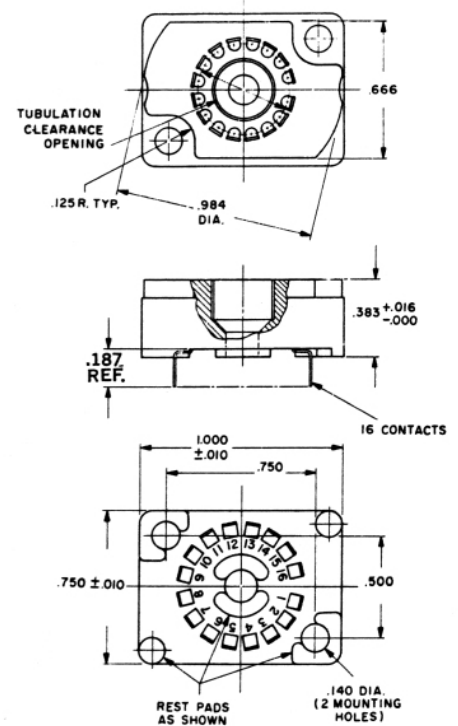
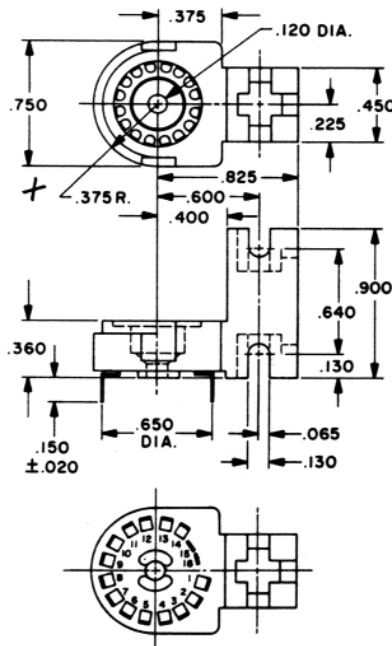
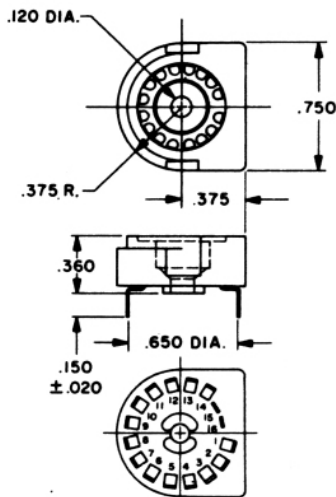


Figure 5. SK-194 and SK-196
(See table 4) (See Notes 3, 9 & 10)

Figure 6. SK-197, SK-198, SK-199 and SK-200
(See table 4) (See Notes 3, 9 & 10)

Figure 7. SK-182 — SK-185
(See table 4) (See Notes 3, 5 & 10)

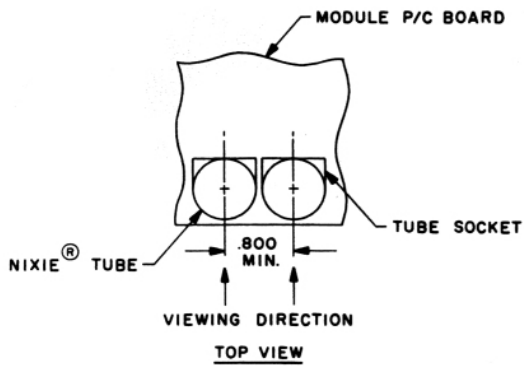


Figure 8. SERIES MOUNTING ON DRIVER MODULE BOARD
0.800" MIN. CENTER-TO-CENTER

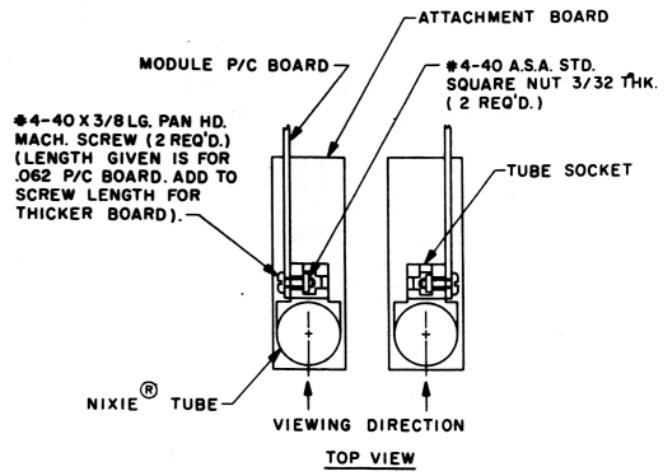


Figure 9a. DRIVER MODULE BOARD RIGHT OR LEFT SIDE MOUNTING
0.800" MIN. CENTER-TO-CENTER

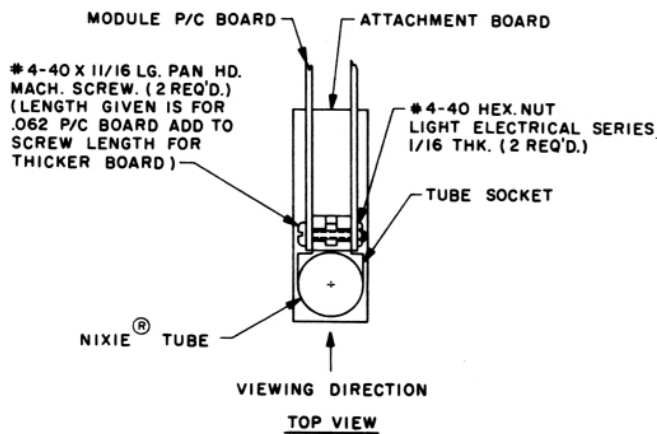


Figure 9b. DRIVER MODULE BOARD DUAL RIGHT AND LEFT SIDE MOUNTING 0.800" MIN. CENTER-TO-CENTER

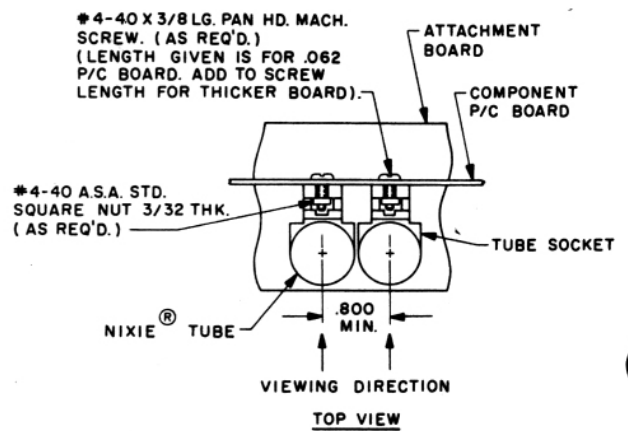


Figure 9c. DRIVER MODULE BOARD SERIES MOUNTING
0.800" MIN. CENTER-TO-CENTER

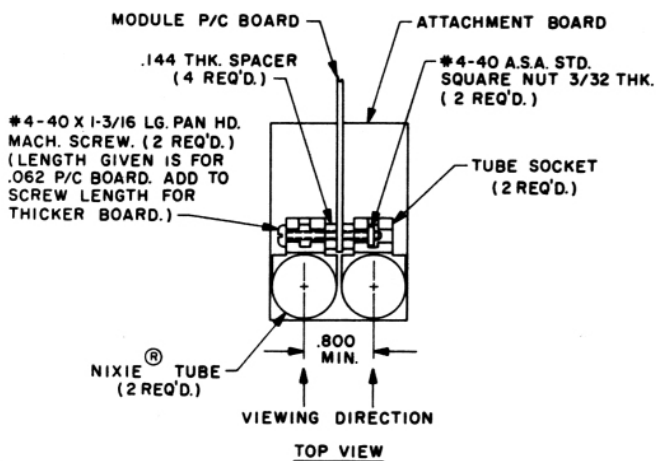


Figure 9d. DRIVER MODULE BOARD DUAL SOCKET MOUNTING
0.800" MIN. CENTER-TO-CENTER

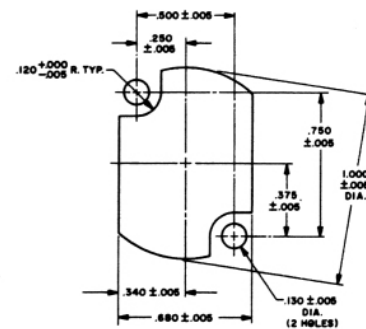


Figure 10. SOCKET MOUNTING LAYOUT
SK-182 — SK-200
(See Note 3)